

ZAYCHIKOVA, L.B.; LUTCHENKO, N.N.

Colorimetric determination of tin in molybdenum concentrates.  
Sbor. nauch. trud. Gintsvetmeta no.18:45-47 '61. (MIRA 16:7)

(Tin—Analysis)

(Molybdenum—Analysis)

ZAYCHIKOVA, L.G.

SOV/137-58-8-18102

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 270 (USSR)

AUTHORS: Gur'yev, S. D., Zaychikova, L. G., Ioffe, V. P., Sarayeva, N. F.,  
Lutchenko, N. N.

TITLE: Increasing the Precision of the Methods of Determination of Lead  
in Lead Concentrates (Utochneniye metodov opredeleniya svintsa  
v svintsovykh kontsentratakh)

PERIODICAL: Sb. nauchn. tr. Gos. n. -i. in-t tsvetn. met, 1958, Nr 14,  
pp 9-20

ABSTRACT: The results of experiments in the study of the effect of Ba,  
Ca,  $\text{SiO}_2$ , and  $\text{SO}_4$  impurities on the determination of large  
quantities of Pb in Pb concentrates are described. The optimum  
analytical conditions are described. Methods for the determina-  
tion of Pb by the molybdate method in Pb concentrates contain-  
ing  $\leq 3\%$  of barite, also the determination of Pb by the chromate  
method with  $< 4\%$   $\text{SO}_4$  in the concentrate are adduced.

1. Lead ores—Impurities    2. Lead—Determination    P. K.

Card 1/1

"APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001964020016-2

1962

APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001964020016-2"

ZAYCHIKOVA, N.V., assistant

Feeding of tomatoes with microelements under glass,  
Sbor.nauch.trud. Ivan.sel'khoz.inst. no.16:119-123 '58.

(MIRA 13:11)

1. Kafedra neorganicheskoy khimii Ivanovskogo sel'skokhozyaystvennogo  
instituta,

(Tomatoes--Fertilizers and manures) (Trace elements)

ZAYCHIKOVA, N V

USSR/Cultivated Plants. Potatoes. Vegetables. Melons.

M-

Abs Jour: Ref Zhur-Biol., No 5, 1958, 20345.

Author : N.V. Zaychikova

Inst : Ivanovskiy Agricultural Institute

Title : On Dressing the Outer Roots of Cabbage Seedlings with Boron. (O vnekornevoy podkormke borom semennikov kapusty).

Orig Pub: Sb. nauchn. tr. Ivanovsk. s.-kh. in-ta, 1956, 14, 195-199.

Abstract: As a result of two years of study of outer root dressings of Slava and Moskovskaya Late variety cabbage seedlings with solutions of boric acid (0.5 kilograms of B per hectare with a solution of the concentration of 100 mg of B per 1 liter), considerable yield increases were obtained in seeds, in increased B content in the cabbage leaves and seeds, as well as in qualitative improvement of the latter.

Card : 1/1

ZAYCHIKOVA, O.N.

ZAYCHIKOVA, O.N., kand.med.nauk

Changes in the physiological function of the connective tissue  
during X-ray treatment of cervical cancer. Medych.zhur. 20 no.5:  
73-81 '50. (MIRA 11:1)

1. Z Kiivs'kogo naukovo-doslidnogo rentgeno-radioonkologichnogo  
institutu (direktor - dotsent I.T.Shevchenko)  
(X RAYS--PHYSIOLOGICAL EFFECT)  
(CONNECTIVE TISSUE)

ZAYONTCVA, V. ZATEVKOVA, T. DMITRIYEVSKAYA, H.

"Branch Norms of Artificial Incandescent Bulb Illumination"  
Ratsional'noye osveshcheniye tokatil'nykh Profizdat  
1951 133 pp. u-1903

DMITRIYEVSKAYA, Nina Petrovna; ZAYCHIKOVA, Valentina Alekseyevna;  
ZATEVKOVA, Tamara Grigor'yevna; MESHKOV, V.V., doktor tekhn.  
nauk, prof., red.; KUZNETSOVA, N.I., red.; ANDREYEVA, L.S.,  
tekhn. red.; KOROBOVA, N.D., tekhn. red.

[Lighting in the enterprises of the textile and clothing  
industries] Osveshchenie predpriyatii tekstil'noi i shveinoi  
promyshlennosti. Pod red. V.V.Meshkova. Moskva, Profizdat,  
1962. 285 p. (Factories--Lighting) (MIRA 16:6)



*ZAYCHIKOVA, V.A.*

DMITRIYEVSKAYA, N.P.; ZATEVKOVA, G.G.; ZAYCHIKOVA, V.A.

Efficient lighting systems in textile weaving mills. Tekst.prom.  
17 no.12:35-37 D '57. (MIRA 11:1)  
(Textile factories—Lighting)

ZAYCHIKOVA, V. A.

SMIRNOV, G.N., kandidat tekhnicheskikh nauk; KUTAHIN, A.F.; ZAYCHIKOVA, V.A.;  
LOBANOV, V.I., retsenzent.

[Safety measures and industrial sanitation in flax mills] Tekhnika bezopasnosti i promyshlennaya sanitariya na l'nozavodakh. Moskva, Gos. nauchno-tekhn. izd-vo Ministerstva promyshlennykh tovarov shirokogo potrebleniya  
SSSR, 1953. 114 p. (MLRA 7:6)  
(Flax) (Textile industry--Safety measures)

DMITRIYEVSKAYA, Nina Petrovna; ZAYCHIKOVA, Valentine Alekseyevna; ZATEVKOVA, Tamara Grigor'yevna; MESHKOV, V.V., doktor tekhnicheskikh nauk professor, redaktor; NOVOSPASSKIY, V.V., redaktor; KIRSAKOVA, N.A., tekhnicheskiiy redaktor.

[Fluorescent lighting for textile, sewing and knitting factories]  
Luminestsentnoe osveshchenie tekstil'nykh shveinykh i trikotazhnykh fabrik. Pod red. V.V. Meshkova. Moskva, Izd-vo VTsSPS Profizdat, 1955.  
158 p. (MLRA 9:4)

(Mill and factory buildings--Lighting) (Fluorescent lighting)

PARIBOK, V.P.; KAL'NIY, V.S.; ZAYCHIKOVA, Z.P.

Effect of acclimatization of animals to hypoxia on the radio-  
sensitivity of nuclear structures. Tsitologiya 3 no.5:602-605  
S-O '61. (MIRA 14:10)

1. Laboratoriya radiatsionnoy tsitologii Instituta tsitologii  
AN SSSR, Leningrad.  
(ANOXEMIA) (CELL NUCLEI)  
(RADIATION—PHYSIOLOGICAL EFFECT)

ZAYCHIKOVIS, V.T.

USSR/Geography - Korea

Mar/Apr 52

"V. T. Zaychikovis Book 'Geographical Work on Korea',  
Second Revised Edition 1951," A. K. Timashev

"Iz Ak Nauk SSSR, Ser Geograf" No 2, pp 86, 87

Book contains history and detailed description of  
the country. The work was accomplished in the Geog  
Inst, Acad Sci USSR and was presented as a doctor's  
dissertation 7 Dec 51.

219756

ZAYCHKIN, S.A., inzhener.

Device for the simultaneous adjustment of the distance between wires  
of the soap-cutting machine. Masl.-shir.prom. 19 no.3:36-37 '54.  
(MLRA 7:6)

1. Irkutskiy mylovarennyy zavod. (Soap) (Cutting machines)

ZAYCHUK, E.S.

3(5) PART I BOOK REPLICATION NOV/22/19  
 RYKIN. Glavnoye upravleniye geologii i obratnyy mezh-  
 Geologicheskoy i neftegazonomast' Vostochnoy Sibiri (Geology and Oil- and  
 Gas-bearing Possibilities of Eastern Siberia) Moscow, Gos-  
 tekhnizdat, 1959. 486 p. 1,620 copies printed.  
 Additional Sponsoring Agency: Vostochno-Sibirskiy neftegeologicheskii  
 trust.

Ed.: V.G. Vasil'yev; Executive Ed.: Ye.G. Perel'man; Tech. Ed.:  
 I.B. Fedotova.

PURPOSE: The book is intended for geologists interested in the  
 stratigraphy, lithology, tectonics, and the oil- and gas-bearing  
 possibilities of the Eastern Siberian platform and Zabaykalye.

CONTENT: This collection of articles contains materials on the strati-  
 graphic classification and lithologic characteristics of sediments  
 of the Cambrian system and of the so-called "ancient" beds devel-  
 oped along the northern slope of the Eastern Sayan Mountains and

the western littoral of Lake Baykal. Extensive information on the  
 petrography and paleontology of these deposits is presented. A  
 number of articles deal with the tectonics of the southern part of  
 the Siberian platform, and others deal with the oil- and gas-bearing possibilities  
 of the Baykal-type depressions. There are 40 tables, 74 figures,  
 and 6 charts. There are 205 Soviet references.

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AVAILABLE: Library of Congress

NOV/24  
 8-20-59

ZAYCHUKOVA, Yevdokiya Andreyevna

[State farm of communist labor] Sovkhoz kommunisticheskogo  
truda. Alma-Ata, Kazakhskoe knizhnoe izd-vo, 1961. 66 p.  
(MIRA 16:2)

(Kazakhstan—State farms)



ZAYCHUKOVA, Ye.

The initiative of people is our major resource. Sev. profsoiuzy  
17 no. 2:14-16 Ja '61. (MIRA 14:2)

1. Direktor sovkhoza "Izhevskiy",  
(Vishnevka District—Socialist competition)  
(State farms)

ZAYCOFF, RASCHKO

Mathematical Reviews

1954

74

Relativity

Zaycoff, Raschko. Einheitsliche Feldtheorie im sechsdimensionalen Raum. Izvestiya Bulgar Akad. Nauk (Ind. Fiz. Mat. Tehn. Nauk. Ser. Fiz.) 2 (1951) 79-98. 1952. Bulgarian, Russian and German summaries. The author's theory is a modification of the general theory of relativity, in which the metric tensor is assumed to be a function of motion. In addition to the electromagnetic and gravitational fields, a new field is present which is apparently connected with the spin properties of matter. The author is able to derive the three main effects of the general theory of relativity, including a value for the deflection of light rays which is in better agreement with observation than that given by the latter, but this involves a certain amount of adjustment of the integration constants to fit the data. N. Rosen (Hailu)

ZAYCOFF, RASCHKO

(1)

Mathematical Physics  
Vol. 15 No. 2  
Feb. 1964  
Relativity

...the theory does not seem satisfactory  
N. Rosen (Held)

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**CIA-RDP86-00513R001964020016-2"**

ZAYDA, I. YE.

Mangel-Wurzel

Growing fodder beet seed., Korm. baza, 3, no. 1, 1952

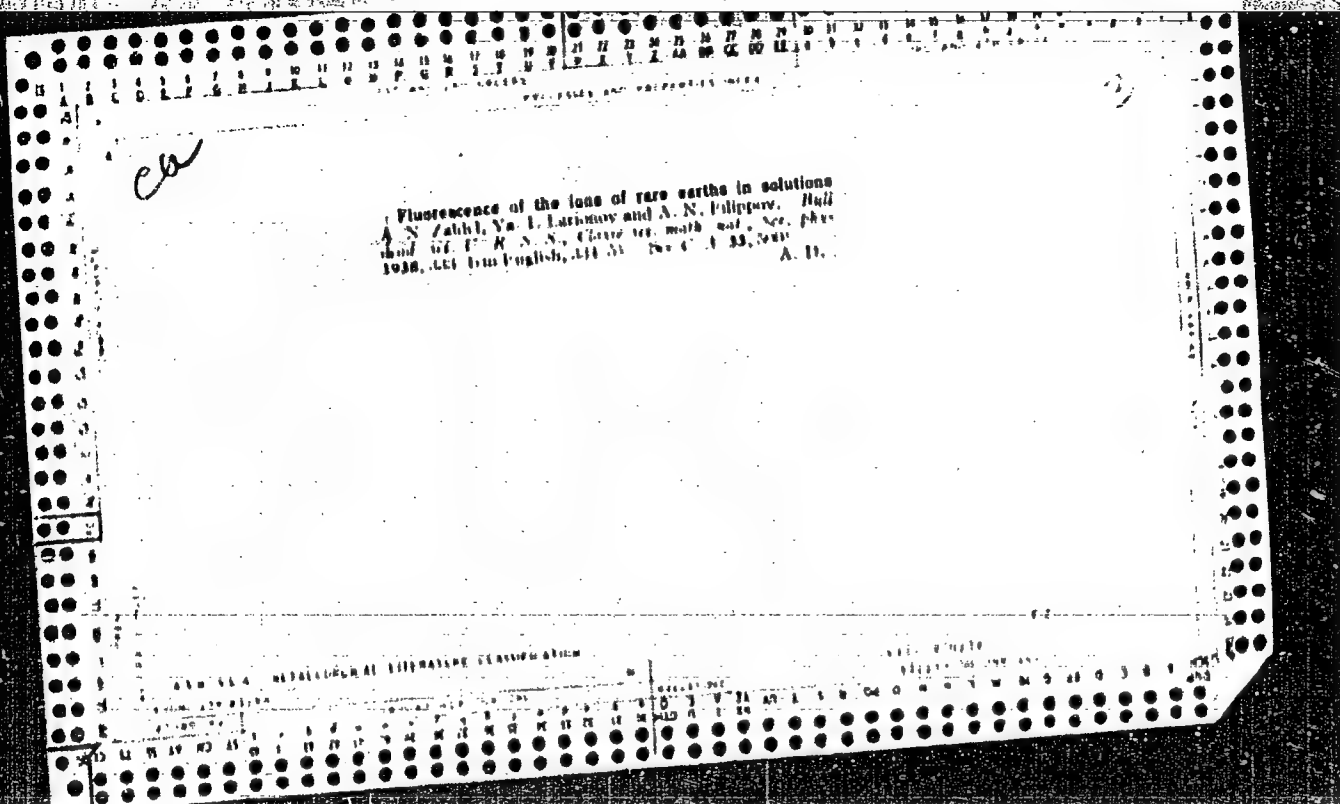
APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001964020016-2"

Monthly List of Russian Accessions, Library of Congress. April 1952. Unclassified.

ZAYD, Ya.A.

Mechanical broaching of hexahedrons. Mashinostroitel' no. 5124 My '65.  
(MIRA 18:5)



1st and 2nd copies  
1st and 2nd copies

PROCESSING AND PREPARATION DATA

5

Nature of the narrow absorption bands in solutions of praseodymium salts. A. Zabel and Ya. Larionov. *Compt. rend. acad. sci. U. R. S. S. 19, 1981 611K(1961) (English).* -- The absorption spectrum of 3 bands of Pr IV 444, 460 and 482 mμ were photographed for tubes 10 and 50 mm. in length, with a diffraction grating of dispersion 10 Å/mm. in the first order, in a camera of focal length 2 m. The values of the oscillator strengths were calculated as 20, 6 and 4 × 10<sup>-4</sup>, resp., for the *4f - 4f* transitions. In spite of large apparent intensities, transition probabilities are low; this is accounted for only by high d. of the absorbing centers as compared with those occurring in absorption in vapors. Gregg M. Evans

ASAC-SLA METALLURGICAL LITERATURE CLASSIFICATION

SECTION ONE ONE ONE

SECTION TWO TWO TWO

SECTION THREE THREE THREE

SECTION FOUR FOUR FOUR

SECTION FIVE FIVE FIVE

SECTION SIX SIX SIX

SECTION SEVEN SEVEN SEVEN

SECTION EIGHT EIGHT EIGHT

SECTION NINE NINE NINE

SECTION TEN TEN TEN

SECTION ELEVEN ELEVEN ELEVEN

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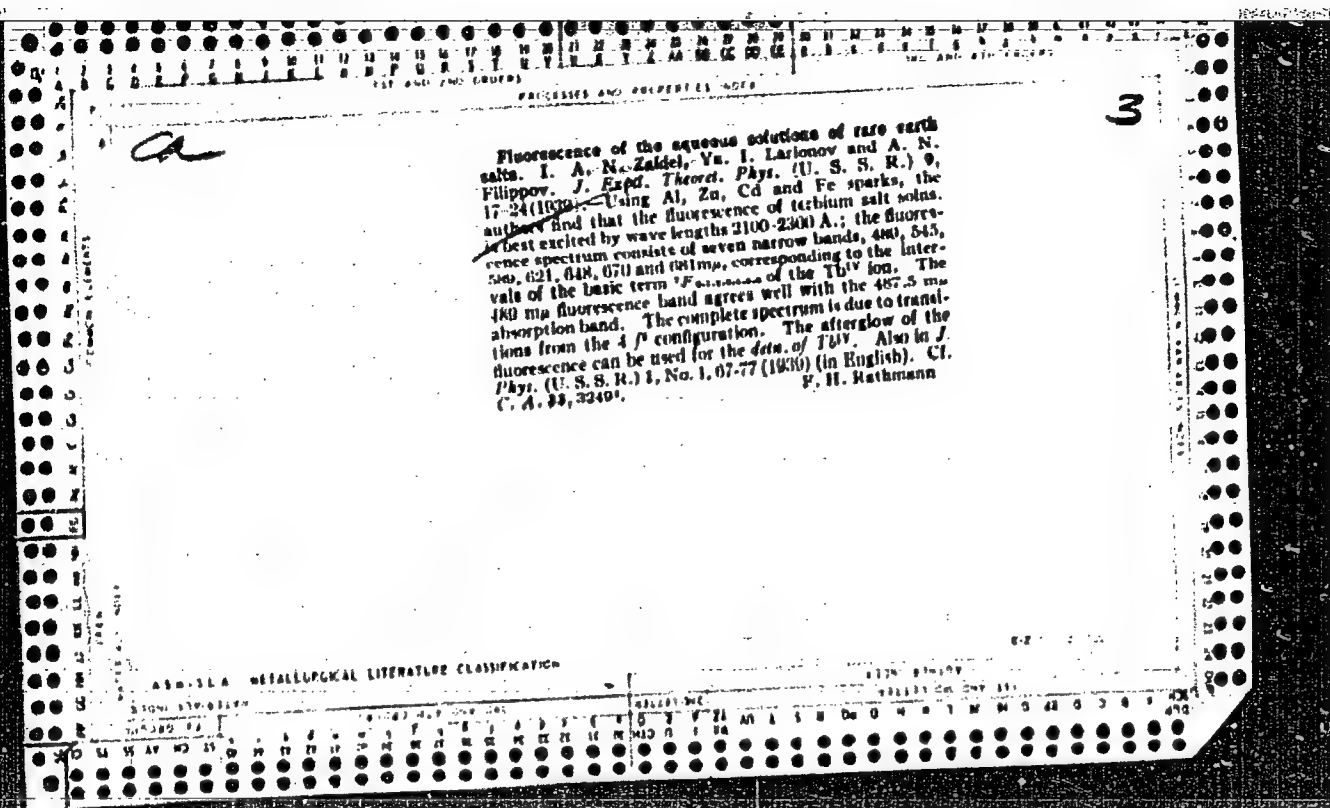
SECTION TWENTY-SEVEN TWENTY-SEVEN TWENTY-SEVEN

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SECTION TWENTY-NINE TWENTY-NINE TWENTY-NINE

SECTION THIRTY THIRTY THIRTY





BC A-1

Structure of fluorescence bands in aqueous solutions of terbium salts. A. ZAIKIN, N. KREMENYUK, and J. LARIONOV (Bull. Acad. Sci. U.R.S.S., 1937, Ser. Phys., 207-211).—The principal max. in the spectra of  $Tb_2(SO_4)_3$ ,  $Tb_2(SeO_4)_3$ ,  $TbCl_3$ , and  $TbBr_3$  are at identical  $\lambda$ .  $TbCl_3$  shows additional fluorescence max. in the yellow ( $TbBr_3$  also) and green regions. J. S. A.

ASM. S. A. METALLURGICAL LITERATURE CLASSIFICATION

| SECTION 1    |  |  |  |  |  |  |  |  |  | SECTION 2    |  |  |  |  |  |  |  |  |  | SECTION 3    |  |  |  |  |  |  |  |  |  | SECTION 4    |  |  |  |  |  |  |  |  |  |
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| SUBSECTION 1 |  |  |  |  |  |  |  |  |  | SUBSECTION 2 |  |  |  |  |  |  |  |  |  | SUBSECTION 3 |  |  |  |  |  |  |  |  |  | SUBSECTION 4 |  |  |  |  |  |  |  |  |  |
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1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES

100 AND 200 CORDS

20

3

The photoluminescence of the solutions of rare earth salts. Ya. Lashnev and A. Zaidi. *Chem. Ind. USSR*, 1964, No. 10, 411. (1964) (U.S.S.R.)

Conducting studies were made to indicate that the photoluminescent band of  $Gd^{3+}$  did not coincide with absorption bands. Accordingly, 0.1-0.5% aq. soln.  $Gd$  sulfate and rhodamine were investigated. In both cases a broad photoluminescent band at 410 nm corresponding to an absorption band was observed. The band at 410 nm is presumably caused by  $Gd^{3+}$  ions not attributed to the presence of  $Gd^{3+}$  as an impurity. Photoluminescence can be utilized analytically to indicate the presence of  $Gd$ ,  $Eu$ ,  $Th$  and  $U$  in solutions as low as  $10^{-4}$  g/l. R. R. Lohr

ASH-568 METALLURGICAL LITERATURE CLASSIFICATION

500000 02

500000 02

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*CA*

*7*

Analytical application of the fluorescence of solutions of rare earth salts. A. Zafel, Ys. Larionov and A. N. Filippov. *J. Gen. Chem.* (U. S. S. R.) 8, 943-8 (in English 948) (1938); cf. C. A. 31, 8590J.—A method is described for the detection of small quantities of Tb, Ce, Gd and Eu, by means of the fluorescence spectra of aq. solns. of their salts. The smallest detectable quantities by this method are  $10^{-6}\%$  Tb,  $10^{-6}\%$  Ce and  $10^{-4}\%$  Eu. Detection of Gd is more difficult than that of the other elements.  
S. I. Madorsky

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

RESEARCH ONE ONLY GET RESEARCH ONE ONLY

| 117 AND 2ND ORDER  |  | PROCESSES AND PROPERTIES INDEX |  |
|--|--|--------------------------------|--|
| <p>Spectroscopy of solutions of the rare earth salts. A. N. Zaidel and Ya. I. Larionov. <i>Uspekhi Fiz. Nauk</i> 21, 211-35 (1939).—The history of the prepn. and purification of the rare earth elements is given. The absorption (visible and infrared), emission and fluorescence spectra in inorg. and org. solvents and the magnetic susceptibilities are considered as functions of the nuclear structures and energy levels of the various members of the group. Fluorescence spectra are considerably more sensitive as criteria of purity of the rare earths than are absorption spectra. Data on the purity of several com. preps. are given. F. H. K.</p> |  |                                |  |
| <p>ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION</p>   |  |                                |  |
| 117 AND 2ND ORDER  |  | 117 AND 2ND ORDER              |  |
| 117 AND 2ND ORDER  |  | 117 AND 2ND ORDER              |  |

ZAYDEL', A. N.

Mbr., Lab. Spectroscopy, Physics Inst. im. P. N. Lebedev, Dept. Physico-

Math. Sci., Acad. Sci., -1940-.

Mbr., Comm. Study Rare Earths, Acad. Sci., -1938-39-;

Mbr., Physics Inst., Leningrad State Univ., -1939-40-.

"On the Fluorescence of Aqueous Solutions of Rare Earth Salts:" 1, Zhur. Eksper.

i Teoret. Fiz., 1939; "On the Electronic Raman Effect," Acta Phys., 13,

No. 4, 1940.

"On the Absorption and Fluorescence of Solutions of Cerium and Praseodymium

Salts," Iz. Ak. Nauk SSSR, Ser. Fiz., 4, No. 1, 1940.

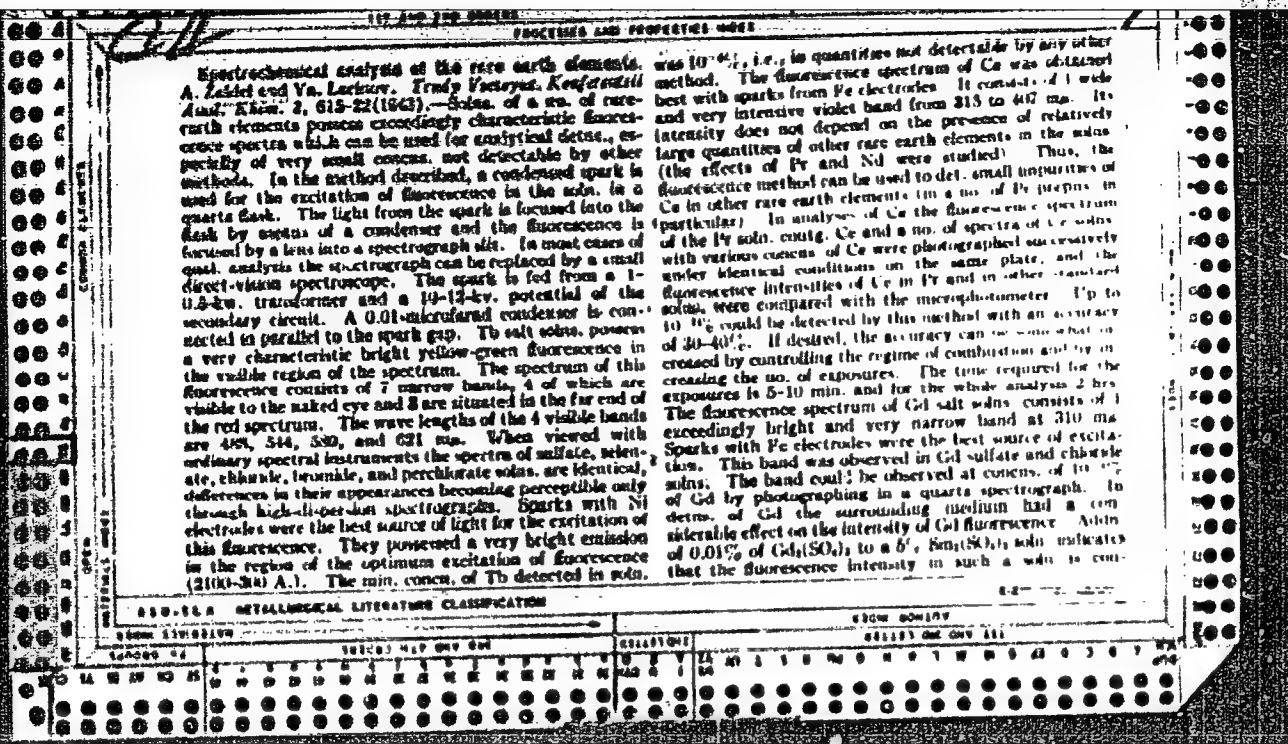
Absorption and fluorescence of solutions of cerium and praseodymium salts. A. M. Zaidel and Ya. I. Lariouov: Bull. and Sci. USSR Ser. phys. 4, 25-8 (1940); cf. U. S. A. 33, 500, 3249-2; 4533-5-- The fluorescence spectrum of Ce salt solutions consists of a band, spreading from

3130 Å. to 4070 Å. This band is attributed to the appearance of Ce<sup>IV</sup> ions under the action of ultraviolet radiation of the spark. This band can be used to detect small cerium contents. (shown to 10<sup>-5</sup>%). Similar broad bands (one in the greenish blue and two in the ultraviolet) were observed in the fluorescence spectrum of Pr salts, excited by Ni or Cd sparks. A broad absorption band with max. about 2160 Å. was also observed in Pr salt solutions.

Rokasina Gerasimov

Absorption spectra of rare earths. A. N. Zaidel  
(Bull. Acad. Sci. U.S.S.R., Ser. Phys., 1961, 5, 111-113).  
The spectrum of  $\text{NdCl}_3$  in aq. HCl is not basically changed  
by heating the solution at  $160^\circ$  above the crit. temp.,  
although the absorption bands (5800 and 5200 Å.) are  
shifted towards red by 20 Å. for every  $100^\circ$  temp. rise.  
It is suggested that the theory of spectrum line broadening  
by foreign gases may be extended to account for the widths  
of absorption bands of rare-earth ions in solution. J.J.P.





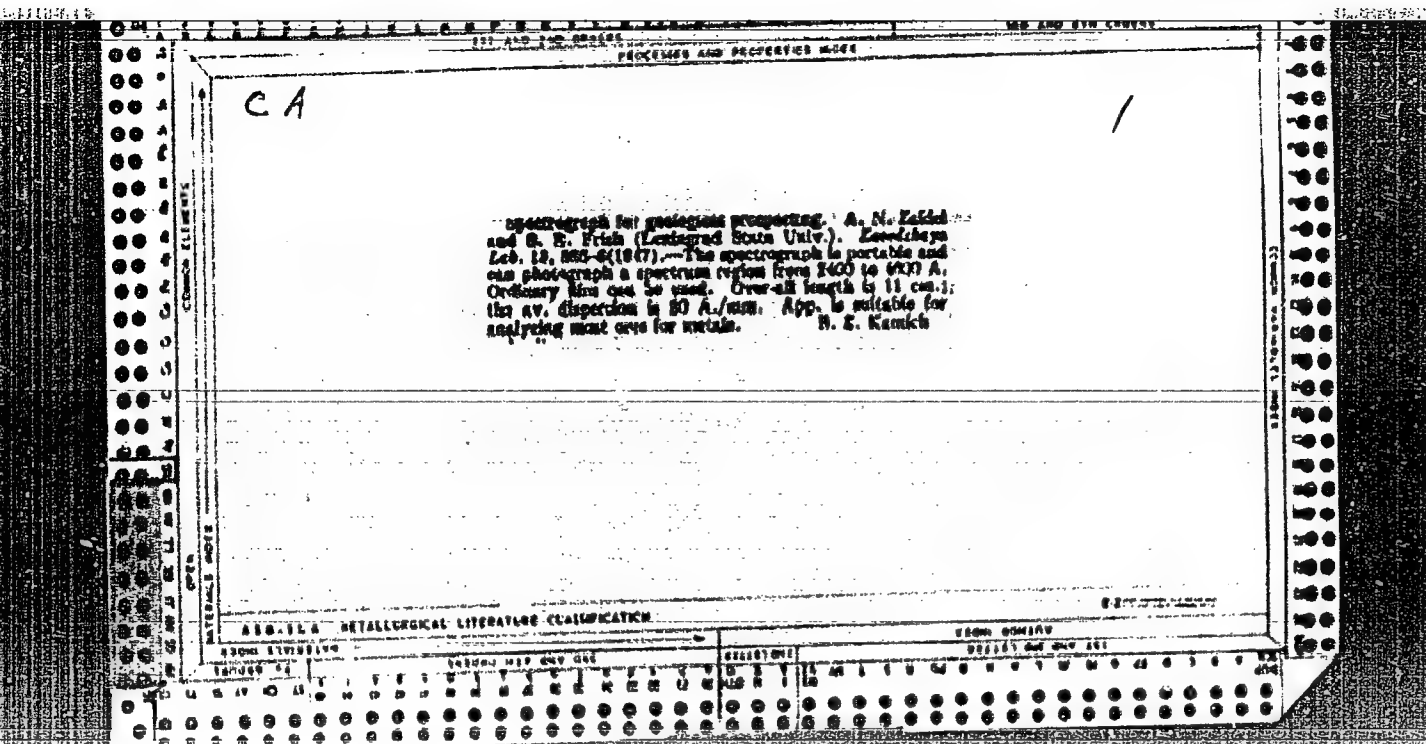
considerably brighter than in a pure 0.01%  $\text{EuCl}_3 \cdot 6\text{H}_2\text{O}$  soln. The increase in the intensity is due to the effect of  $\text{SO}_2$ , which has a stabilizing effect on the fluorescence of  $\text{Eu}^{3+}$ . The mechanism of this effect is not clear, but is, probably, connected with complex formation in the soln. The fluorescence spectrum of  $\text{Eu}^{3+}$  consists, in the visible spectrum, of a no. of bands the brightest two of which are visible at 611 and 610 m $\mu$ .  $\text{Eu}^{3+}$  can be best excited with Fe sparks. The sensitivity of the soln. is not great (about 0.01% in soln.). Solns. of  $\text{Eu}^{3+}$  do not fluoresce when excited with Fe sparks. The presence of  $\text{SO}_2$  is necessary to produce fluorescence. The other elements which showed a fluorescence in solns. were: Nd, Pr, Sm, and Dy. Tm, Er, Ho, and Yb have not been studied. 13 references. W. R. Henn

ZAYDEL', A.N.

IAN-per Fiz Vol IX No 10 4/5/ 1945.

CONFERENCE ON PROBLEMS OF LUMINESCENCE (OMN-AN-SSR FROM 5 to 10 Oct 1944)

"Luminescence of Solutions of Rare Earth Salts". ~~XXXXXXXXXXXXXXXXXXXX~~



ZAYDEL, A. and ROTSHTEYN, V.

"The Solvation of Neodymium Ions in Alcohol Water Systems," Dok. AN, 57, No. 6, 1947

ZAIDEL', A. N.

N/5  
613.493  
.Z2

Tablitsy spektral'nykh liniy (Tables of spectral lines,  
by) A. N. Zaidel, V. K. Prokof'ev, S. M. Rayskiy. Moskva,  
Gos. Izd-vo tekhniko teoret. lit-ry, 1952. 560 p. tables.

ZAYDEL', A. N.

PA 235T19

USSR/Chemistry - Rare Earths

21 Jul 52

"The Fluorescence of Samarium and Gadolinium in Borax," A.N. Zaydel', G.P. Malakhova, Phys Inst, Leningrad State U imeni A.A. Zhdanov

"Dok Ak Nauk SSSR" Vol 85, No 3, pp 591-593

The fluorescence found in borax beads contg Gd is due to Sm or Eu. Gd does not have any fluorescence in the visible region. Presented by Acad A.N. Terenin 28 May 52.

235T19

ZAYDEL, A. I Dr.

Tablitsy Spektralnykh Linii (Tables of Spectral Lines)

560 p. 3.00

80: Four Continent Book List, April 1954



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Zaydel, A-N

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CIA-RDP86-00513R001964020016-2"

USSR/Optics - Optical Methods of Analysis. Instruments, K-7

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35875

Author: Zaydel, A. N., Kaliteyevskiy, N. I., Lipis, L. V., Chayka, M. P.,  
Belyayev, Yu. I.

Institution: Leningrad State University and Institute of Geochemistry and  
Analytical Chemistry, Academy of Sciences USSR

Title: Spectral Analysis Using the Evaporation Method. I. Principle of  
the Evaporation Method of Evaporating Admixtures in Vacuum and  
Certain of Its Applications

Original

Periodical: Zh. analit. khimii, 1955, 11, No 1, 21-29

Abstract: A new method was developed for spectroanalysis of low-volatility  
compounds with small admixtures of volatile contaminations. The  
analysis method is based on preliminary distillation of the admix-  
tures from the sample and their condensation on the end surface of  
a cooled copper or graphite electrode. The evaporation of the ad-  
mixtures is performed in vacuum from a sample, placed inside a  
graphite crucible, clamped between 2 graphite blocks and heated by

Card 1/2

USSR/Optics - Optical Methods of Analysis. Instruments, K-7

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 35875

Abstract: current from a step-down transformer. The layer of admixtures on the surface of the electrode is then analyzed by ordinary methods of spectral analysis. The sensitivity of the method is quite high and reaches values of approximately  $10^{-5}\%$  in the determination of the majority of volatile admixtures. The average squared error of a single determination is 10-20%. It depends on the element to be determined, on its concentration, and on the properties of the substance that is being analyzed. The analysis error can be reduced by rational choice of the internal standard. A discussion is made of the investigation of the fundamentals of the method of spectroscopic method and with the aid of radioactive tracers and of its application to the analysis of pure aluminum oxide.

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**"APPROVED FOR RELEASE: 03/15/2001**

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*Zaydel, A.N.*  
USSR/Optics - Optical Methods of Analysis. Instruments.

K-7

Abs Jour : Referat Zhur - Fizika, No 5, 1957, 13076

Author : Vinnichinko, E.N., Zaydel', A.N.

Inst : -

Title : Concerning the Influence of the Atmosphere of Rare Gases  
on the Sensitivity of the Spectral Analysis.

Orig Pub : Vestn. Leningr. un-ta, 1956, No 10, 22-28

Abstract : A study was made of the influence of an atmosphere of helium and argon on the absolute and concentrational sensitivity of the determination of many elements in the ac spark and in the ac arc. The absolute sensitivity was studied with solutions of chlorides of beryllium, gadolinium, and cadmium, coated on metallic electrodes in both a closed chamber with argon, as well as in an argon current. In the case of a spark, connected in a complicated circuit, the intensities of all the lines in the air were greater than in argon. In the case of an ac arc, at a

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ZAYDEL, A. N., KALITEYEVSKIY, N. I., LIPOVSKIY, A. A., RAZUMOVSKIY, A. N.  
and YAKIMOVA, P. P.

"Spectral Analysis of the Gd, Eu, and Sm Content of Metals,"  
by A. N. Zaydel', N. I. Kaliteyevskiy, A. A. Lipovskiy, A. N.  
Razumovskiy, and P. P. Yakimova, Vestnik Leningradskogo Uni-  
versiteta, Vol 11, No 4, Oct-Dec 56, pp 18-40

In the introduction to the article, it is pointed out that a number of rare earth elements including Gd, Eu, and Sm have exceptionally large cross sections of thermal neutron capture (38,000 barns for Gd, 2,500 barns for Eu, and 8,000 barns for Sm), which are equaled only by that of Cd (2,800 barns) and that consequently many materials must be freed of even the smallest trace of these elements. To accomplish this, sensitive methods of analysis are required: the sensitivity of the determinations must be no less than of the order of 0.0001%. It is stated that although two US papers on the spectroscopic determination of small amounts of rare earths in uranium and one US paper on the determination of rare earths in zirconium have been published, a reliable, universally applicable method for the determination of rare earths in metals is lacking.

The authors then say that work on the development of a suitable method for this purpose was conducted at their laboratory during the period 1949-1954, and proceed to outline the results of this work, which dealt with the development of a set of analytical procedures based on emission spectroscopy. They first discuss the method of concentration of rare earth elements used by them, which involves introduction of lanthanum that acts as a carrier. A general section on the spectral analysis of the concentrates obtained by the method described follows. A detailed description of the determination of traces of Gd, Eu, and Sm in thorium is then given. According to the description, the rare earth elements are separated from thorium before the spectral analysis by extracting the nitrates with ether. The effects on the analytical procedure of impurities consisting of iron, aluminum, silicon, chromium, and cerium are discussed. The procedure for the determination of Gd, Eu, and Sm in uranium, which is described in the next section, is essentially the same as that for thorium.

In the section on the determination of Gd, Eu, and Sm in beryllium, the statement is made that beryllium oxide which is used in nuclear power technology must be pure, and that the determination of traces of Gd, Eu, and Sm in beryllium is therefore of considerable practical importance. Separation of the rare earths (including the La carrier) from Be in the procedure described is achieved by precipitation with oxalic acid from a  $\text{BeCl}_2$  solution with the use of calcium as an additional carrier.



In connection with the description of the procedure for the determination of Gd, Eu, and Sm in bismuth, it is stated that Bi has a small cross section of thermal neutron capture and can be used as a reactor coolant. Under the circumstances, according to the article, procedures by which one may check for the presence in bismuth of rare-earth elements with a large cross section of neutron capture are essential. Separation of the rare-earth elements from bismuth is effected by the hydrolytic decomposition of bismuth chloride during the course of electrolysis.

The section on the determination of rare-earth impurities in zirconium is introduced by the statement that zirconium is used as a construction material for nuclear reactors, because it has a small cross section of thermal neutron capture and a sufficiently high stability at high temperatures. According to the article, zirconium for nuclear reactor applications must be free of rare-earth elements with a large neutron capture cross section. The chemical procedure for the separation of the rare earth elements from zirconium, which is based on the precipitation of Zr in the form of its phosphate and that of the rare earth elements in the form of their oxalates, is rather complicated. It is described in detail and illustrated with a chart.

In conclusion the authors say that the results of the work done by them on the determination of Gd, Eu, and Sm in Th, U, Be, Bi, and Zr confirm the advisability of using the analytical procedure which they have developed. They add that they have also done work on the determination of rare earth elements in Fe, Al, and Mg in connection with investigations on the rare-earth content in soils and checked the possibility of applying their method in the determination of Gd, Eu, and Sm in Cu. They found that the sensitivity of the determination of Gd, Eu, and Sm in all the metals mentioned above amounted to approximately  $10^{-5}\%$ , and that this sensitivity can be increased still further by subjecting larger samples to analysis. For the reasons stated, they assume that the method used by them is satisfactory and generally applicable for the purpose of determining rare-earth elements in metals.

Sum 1258

USSR/Analysis of Inorganic Substances

G-2

Abstr Jour: Ref Zhur-Khimiya, No 5, 1957, 19640

Author : A. N. Zaydol'

Inst : Leningrad University

Title : Spectral Analysis of Pure Metals.

Orig Pub: Vestn. Leningr. Un-ta, 1956, No 16, 29 - 44.

Abstract: Detailed review of some work carried out with author's participation. The determination of a series of elements in Al by the method of evaporation of admixtures in vacuum after the conversion of the sample into  $Al_2O_3$  is described. The admixtures separated from the basic mass by evaporation are analysed spectrally in the usual way. The sensitivity of the analysis in respect

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USSR/Analysis of Inorganic Substances

G-2

Abs Jour: Ref Zhur-Khiniya, No 6, 1957, 19640

to the majority of elements is 1 to  $5 \times 10^{-5}\%$ . The methods of determination of traces of rare earth elements Cd, Eu and Sm in Al with the preliminary chemical concentration achieved with simultaneous precipitation with the carrier lanthanum are described. The possible losses of the concentrated metals are accounted for quantitatively by the radioactive indicator method taking into consideration the residual activity of the sample. The method of hydrogen determination in metals based on the preparation of equiponderant isotope mixtures of gases with their subsequent analysis by exciting spectra in discharge tubes is also described. This method does not

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~~ZAYDEL', Aleksandr Natanovich; PETROV, Arkadiy Anatol'yevich; VEYNBERG,~~  
~~Galina Vsevolodovna; MOISEYEVA, L.V., redaktor; IVANOVA, A.V.,~~  
tekhnicheskii redaktor

[Spectral-isotope method of determining hydrogen in metals]  
Spektral'no-izotopnyi metod opredeleniia vodoroda v metallakh.  
[Leningrad] Izd-vo Leningr.univ., 1957. 104 p. (MLRA 10:9)  
(Metals--Analysis) (Hydrogen--Analysis)  
(Spectrum analysis)

USSR/Soil Science - Physical and Chemical Properties of Soil. J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86763

Author : Vinnichenko, E.N., Zaydel', A.N., Yakimova, P.P.

Inst : Leningrad University

Title : Determination of Cobalt in Soils.

Orig Pub : V. sb.: Primeneniye metodov spektroskopii v prom-sti prodovol'stva tovarov i s. kh., L. LGU, 1957, 23-27, Diskus. 27-28

Abstract : A method for spectral determination of Co in soils is described. Co was extracted from soil heated at 500° by boiling for 6 hours with 6% HCL. Before boiling Co<sup>60</sup> was introduced into the sample for control of losses during the chemical operations. Co was precipitated in hydrochloric acid extract together with a series of other elements by ortho-hydroxyquinoline. For the separation

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USSR/Soil Science - Physical and Chemical Properties of Soil.

J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86763

of Co from large quantities of Al, Cr, Ti and Zn, the precipitate of hydroxyquinolates was heated at 450-500° and dissolved in HCl, after which Co was precipitated in a tartaric acid medium by ammonium sulfide in the presence of Fe. After precipitation by ammonium sulfide, the precipitate was centrifuged, dissolved in 6.5 n. HCl, Fe was extracted by ether. After the separation of Fe the water was evaporated, the precipitate dissolved in 2 to 3 drops of 5% HCl. In the solution derived, Co was determined spectrally. Checking Co losses by measurement of  $\gamma$ -activity showed that in the process of chemical concentration 80% of the Co originally present in the soil is extracted. The spectral analysis was made by the three-standard method. Introduced in each test sample was  $2.5 \cdot 10^{-6}$  grains of Ag which served as the interval standard. The authors think that a batch of 1 gram does not yield reliable results and propose that 8 grams of soil be taken for extraction of Co,

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Abs Jour : Ref Zhur Biol., No 19, 1958, 86763

analyzing further one-eighth of the derived extract. With this method, the mean arithmetical error is 15%. The research was performed at Leningrad University. The bibliography lists 8 titles. -- K.V. Verigina

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USSR/Soil Science - Physical and Chemical Properties of Soil.

J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86767

Author : Zaydel', A.N., Kaliteyevskiy, N.I., Razumovskiy, A.N.

Inst : Leningrad University.

Title : Determination of the Content of Certain Rare-Earth Elements in Soils.

Orig Pub : V.sb.: Primeneniye metodov spektroskopii v prom-sti prodovol'stvennykh tovarov i s.kh., L., LGU, 1957, 29-35.  
Diskus. 35-38

Abstract : A method of determining the content of La, Nd, Gd, Eu, Sm in soils, based on chemical concentration and subsequent spectral analysis of soil specimens. The procedure is described in chemical concentration of soil specimens with the indicated elements. As carrier and internal standard 100 to 200 mg. La are introduced in the test sample.

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.. USSR/Soil Science - Physical and Chemical Properties of Soil.

J

Abs Jour : Ref Zhur Biol., No 19, 1958, 86767

For calculation of the La content in the soil, a parallel analysis is made using Nd as carrier and internal standard. Synthetic mixtures that contain a known quantity of La and all elements being determined serve as calibrating devices. Examples are cited of the computation of the determined elements in the soils. -- K.V. Verigina

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Zaydel, A. N.

51-1-3/18

AUTHORS:

Zaydel', A. N., Kaliteyevskiy, N. I., Lipis, L. V.  
and Tarakanov, V. M.

TITLE:

Spectral Analysis by the Evaporation Method. V. Analysis  
of Plutonium by the Method of Evaporation in Vacuum.  
(Spektral'nyy analiz po metodu ispareniya. V. Analiz plu-  
toniya metodom ispareniya v vakuume)

PERIODICAL:

Optika i Spektroskopiya, 1957, Vol.III, Nr.1, pp.16-20.  
(USSR)

ABSTRACT:

Refs. 1-3 describe spectral analysis using the evaporation  
method. This method is applied here to plutonium which  
presents particular difficulties because of its chemical  
toxicity, -activity and absence of data on its physical  
properties. A technique was developed using thorium,  
lanthanum and uranium in place of plutonium. First the  
general character of the spectrum was investigated. A  
sample of plutonium was obtained by depositing a drop of  
 $\text{PuCl}_4$  on a copper electrode. This drop was slowly evapora-  
ted to form a layer of plutonium oxychloride. This elec-  
trode was then placed in a chamber with four quartz windows  
(Fig.1). This arrangement permitted recording of  
spark and arc spectra by four

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51-1-3/18

Spectral Analysis by the Evaporation Method. V. Analysis of Plutonium by the Method of Evaporation in Vacuum.

instruments simultaneously. The plutonium spectrum was excited in argon at 500 mm Hg. Using four spectrographs plutonium spectra in the region 2000-6500 Å were obtained (Fig.2). The spectra obtained indicated that determination of the amounts of Ca, Ti, W, Mo and Al in Pu was possible by combustion of Pu chloride deposits (sensitivity of 0.005-0.01%). Enrichment would be necessary for determination of many impurities. The authors found that PuO<sub>2</sub> was the best substance to use for spectral analysis provided it was not heated above 1800°C. At 1800°C about 0.001% of Pu evaporated in 1 minute. In the standards necessary for this type of analysis PuO<sub>2</sub> could be replaced by ThO<sub>2</sub>. Using ThO<sub>2</sub> standards, Na, K, Li, Mn, Si, B, Co, Cd, Ag impurities in Pu could be determined quantitatively. The technique of preparation of those standards is described in Ref.1. PuO<sub>2</sub> was prepared by heating of Pu in a muffle furnace. The sensitivity and precision of determination of volatile impurities in PuO<sub>2</sub> is no lower than for similar analysis

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Spectral Analysis by the Evaporation Method. V. Analysis of  
Plutonium by the Method of Evaporation in Vacuum.

of other metals (Th, U, Zr, Be). In some cases only  
1-2  $\mu$ g of Pu were necessary. No numerical results of  
Pu analysis are given in this paper. The authors thank  
M. P. Chayka, G. I. Zhuravlev, T. G. Fedorov and  
L. I. Averbakh who took part in some of this work.  
There are 2 figures, 1 table and 9 references, 6 of which  
are Slavic.

SUBMITTED: February 5, 1957.

AVAILABLE:

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102)

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ZAYDEL', A. N. and others

"The Further Development of the Isotopic Equilibrium Method for the Determination of Hydrogen in Metals."

report presented at the Conference on Analysis of Cases in Metals, by Inst. Geochemistry and Analytical Chemistry im V. I. Vernadsky AS USSR and Committee for Analytic Chemistry, AS USSR, Moscow, 24-27 June 1958

ZAYDEL', A.M.; KALITSEVSKIY, N.I.; KURD, G.G.; FRATKIN, Z.G.

Function of carriers in the spectrum analysis of materials of  
low volatility. Vis.sbor. no.4:29-30 '58. (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudar-  
stvennogo universiteta imeni A.A.Zhdanova.  
(Uranium compounds---Spectra)



ZAYDEL', A.N.; KALITEYEVSKIY, N.I.; LIPIS, L.V.; CHAYKA, M.P.

Spectrum analysis of thorium and beryllium by the vacuum evaporation method. Fiz.sbor. no.4:31-32 '58. (MIRA 12:5)

1. Fizicheskii institut Leningradskogo ordena Lenina gosudarstvennogo universiteta imeni A.A.Zhdanova.  
(Thorium--Spectra) (Beryllium--Spectra)

ZAYDEL', A.N.; KALITEYEVSKIY, N.I.; LIPOVSKIY, A.A.; HAZUMOVSKIY, A.N.;  
YAKIMOVA, P.P.

Spectrochemical determination of Gd, Eu, and Sm in metals.  
Fix.sbor. no.4:37-40 '58. (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudar-  
stvennogo universiteta imeni A.A.Zhdanova.  
(Gadolinium--Spectra) (Europium--Spectra) (Samarium--Spectra)

ZAYDEL', A.N.; PETROV, A.A.; PETROV, K.I.

Spectral determination of hydrogen in metals employing an isotopic equilibrium. Fiz.sbor. no.4:206 '58. (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudarstvennogo universiteta imeni A.A.Zhdanova.  
(Hydrogen--Spectra) (Metals--Hydrogen content)

BORGEST, V.A.; VEYNBERG, G.V.; ZAYDEL', A.N.; PETROV, A.A.

Spectrum analysis of isotopes of a hydrogen-deuterium mixture.  
Fix.shor. no.4:207-209 '58. (MIRA 12:5)

1. Fizicheskiy institut Leningradskogo ordena Lenina gosudar-  
stvennogo universiteta imeni A.A.Zhdanova.  
(Hydrogen--Spectra)

ZAYDEL', A.N.

51-4/-2-4/28  
and Chayko, Yu.

AUTHORS: Zhiglinskiy, A. G., Zaydel', A. N.  
TITLE: On the Problem of Spectral Determination of the Isotopic Composition of Lead. (K voprosu o spektral'nom opredelenii izotopnogo sostava svintsa.)  
PERIODICAL: Optika i Spektroskopiya, 1958, Vol.IV, Nr.2, pp.152-155 (USSR).

ABSTRACT: The method of spectral analysis of the isotopic composition of lead, using photoelectric recording of hyperfine structure of the Pb I line at 4 058 Å observed by means of a Fabry-Perot etalon, was described earlier by Zhiglinskiy (Ref.1). Several months later Brody, Tomkins and Fred (Ref.2) described a similar method. Zhiglinskiy used two approaches to the problem of isotopic analysis. First he assumed that intensities of the isotopic spectral structure components are in the same ratios as the concentrations of the corresponding isotopes. In this case a number of corrections were necessary in the calculations. Secondly Zhiglinskiy checked the first method by the use of calibrating standards of known isotopic composition. He found that isotopic analysis without the use of standards was

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On the Problem of Spectral Determination of the Isotopic Composition of Lead.

accurate to about 7%, while using standards this accuracy could be improved to about 4%. Brody, Tomkins and Prod (Refs. 2, 3) employed the method which does not require standards. In that method the main errors are due to overlapping of lines and to re-absorption. The corrections necessary for overlapping and re-absorption increase with the increase of the current density in the hollow discharge tube used, as well as with the decrease of the resolving power of the apparatus. The authors of Ref.2, 3 had to work at high current densities and insufficient resolving power. The poor resolving power is shown in Fig.1, where the left-hand curve was obtained by the present authors and the right-hand curve is copied from Ref.2. Under the conditions selected by the authors of Ref.2, 3, self-absorption was so great that correction for it reached 0.5 of the observed intensity values. To avoid the errors of Refs. 2, 3, the present authors repeated measurements using low current densities and cooling the hollow cathode with liquid air. The lines

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51-4-2-4/28

On the Problem of Spectral Determination of the Isotopic Composition of Lead.

were then found to be practically free from self-absorption, and they possessed small Doppler width. The resolving power of the apparatus was sufficient to obtain complete resolution of the hyperfine structure components, except the components of  $Pb^{208}$  and  $Pb^{207s}$ . Fig.2 shows that the optical results obtained by the authors agreed very well with mass-spectrometric data. If, instead of liquid air, water is used for cooling of the hollow cathode, the Doppler width is higher and consequently the results for  $Pb^{207}$  and  $Pb^{208}$  isotopic concentrations are poorer (Table 1). Lowering of the temperature of the hollow cathode does not affect the

results of  $Pb^{206}$  very much. Under the conditions used by the present authors it is possible to determine concentrations of isotopes down to 1% (Table 2). When the concentration of the isotope is higher than 10% the relative precision of analysis described here amounts to 2 - 4% of the isotopic content. This precision is comparable with mass-spectrometric measurements. There are 2 figures, 2 tables, and 5 references of which 2 are

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51-14-2-4/28

On the Problem of Spectral Determination of the Isotopic  
Composition of Lead.

Soviet, 2 English and 1 German.

University.

ASSOCIATION: Scientific Research Institute of Physics of the Leningrad State/  
(Nauchno-issledovatel'skiy fizicheskiy institut,  
Leningradskogo gosudarstvennogo universiteta.)

SUBMITTED: May 11, 1957.

1. Lead isotopes-Determination analysis
2. Lead isotopes-Spectrographic

Card 4/4



AUTHOR: Zaydel', A.N. 51-4-5-26/29

TITLE: On Determination of the Isotopic Composition from Absorption Spectra  
(Ob opredelenii izotopnogo sostava po spektram pogloshcheniya)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol IV, Nr 5, pp 701-702 (USSR)

ABSTRACT: This is a theoretical note suggesting the use of absorption spectra for isotopic analysis of substances placed in gas flames. Modulated light from a source containing one of the two isotopes studied passes through the gas flame and a monochromator is used to separate out a particular line. The absorption coefficient for this line (emitted by the source) is measured. The same procedure is repeated for the second isotope. Simple relationships are obtained if the line used for measurements has no hyperfine structure and if the separation between the isotopic components is much greater than the measured line half-width. The method may be extended to an analysis of a mixture of more than two isotopes. Experimental results will be published later.

ASSOCIATION: Nauchno-issledovatel'skiy fizicheskii institut Leningradskogo Gosudarstvennogo universiteta (Scientific Research Institute of Physics) Leningrad State University)

~~Card 1/2~~

SOV/51-5-6-8/19

AUTHORS: Borgest, V.A. and Zaydel' A.N.

TITLE: Application of an Interference-Polarization Filter in the Analysis of the Isotopic Composition of Hydrogen-Deuterium Mixtures (Primeneniye interferentsionno-polyarizatsionnogo fil'tra dlya analiza izotopnogo sostava vodorodno-deyteriyevykh smesey)

PERIODICAL: Optika i Spektroskopiya, 1958, Vol 5, Nr 6, pp 686-691 (USSR)

ABSTRACT: The authors describe two variants of Wood's interference-polarization filter and their use in the isotopic analysis of hydrogen with less than 0.1% or more than 10% (10-90%) of deuterium. The filter is used to separate out  $\alpha$ -lines of H and D. It consists of an Iceland spar plate of 7.5 mm thickness, cut parallel to its optical axis and placed between two crossed (or parallel) polarizers in such a way that the optical axis of the crystal makes  $45^\circ$  with the plane of polarization. If a parallel beam of monochromatic light is passed through the filter then the emergent beam will be elliptically polarized due to double refraction and interference between the ordinary and extraordinary rays. If the plate thickness  $d$  satisfies the following equality  $2\mu d = 2k\lambda_1 = (2k + 1)\lambda_2$

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SOV/51-5-6-2/19

Application of an Interference-Polarization Filter in the Analysis of the  
Isotopic Composition of Hydrogen-Deuterium Mixtures

where  $\lambda_1$  and  $\lambda_2$  are the wavelengths of  $H_\alpha$  and  $D_\alpha$  lines,  $\mu$  is the difference between the refractive indices of the ordinary and extraordinary rays and  $k$  is an integer, then the rays of wavelengths of  $\lambda_1$  and  $\lambda_2$  will be polarized at right angles to each other. The second polarizer may then be used to extinguish one of the lines. In practice extinction is not complete because the beam is not ideally monochromatic, the angular width of the beam is finite and the Iceland spar plate is not perfect and because scattered light is present. It is possible to reduce the intensity of one ray with respect to the other ray by a factor of 40. The intensities of the two lines (one considerably weaker) may be compared either (1) after spectral separation of the beam using a TS-1 spectrograph with a diffraction grating, or (2) using a visual photometer consisting of a Wollaston prism and an analyser (the analyser is rotated to make the intensities of both lines the same). In the latter case rough monochromatization of light was necessary which was produced by means of an interference or an absorption filter. Method (1) was used for deuterium concentrations of less than 0.1%; method (2) was used for deuterium concentrations of 10-90%. The

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Application of an Interference-Polarization Filter in the Analysis of the  
Isotopic Composition of Hydrogen-Deuterium Mixtures

optical system for deuterium of small concentrations of deuterium is shown in Fig 1. Polaroids  $N_1$  and  $N_2$  are placed in a parallel beam between lenses  $L_1$  and  $L_2$ ; the polaroids are crossed and rotated to positions in which the optical axis of the crystal  $P$  bisects the angle between their planes of polarization. In order to make sure that the intensity ratio  $J_D/J_H$  of the two lines did not change by more than 5% during an experiment, it was necessary to control the temperature of the crystal plate  $P$  to within 0.005°C. The isotopic analysis of hydrogen with small concentrations of deuterium was carried out using a calibration curve constructed from measured ratios of the intensity of the weakened line of hydrogen to the intensity of the non-weakened line of deuterium in mixtures of known composition. When the interference polarization filter is used in visual analysis a Wollaston prism is necessary which separates spatially the deuterium and hydrogen lines. The optical system for visual observation, used for the analysis of H-D mixtures with 10-90% of D, is shown in Fig 3. In this figure  $F$  denotes a filter used for rough monochromatization,  $S$  is the entrance slit,  $L_1$  is a collimating lens,  $N$  is a polarizer,  $P$  is the crystal,  $W$  is a Wollaston prism,  $A$  is an analyser and  $G$  represents the eye of

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SOV/61-5-3-8/19

Application of an Interference-Polarization Filter in the Analysis of the  
Isotopic Composition of Hydrogen-Deuterium Mixtures

the observer. Since the deuterium and hydrogen lines are polarized in mutually perpendicular planes, their ratio of intensities can be measured by making the fields of view equal using the analyser A. In the visual method careful control of the temperature of the crystal P is not necessary. Fig 5 shows a discharge tube which was used as a standard when filled with a known H-D mixture. Such tubes were found to work satisfactorily for 20-30 hours without a break (one reading in determination of D concentration takes 30-40 sec). There are 3 figures and 5 references, 2 of which are American, 1 Soviet, 1 international and 1 translation.

SUBMITTED: January 21, 1958

Card 4/4

K

CZECHOSLOVAKIA/Optics - Optical Methods of Analysis.

Abs Jour : Ref Zhur Fizika, No 1, 1960, 2265

Author : Zajdel, A., Zhiglinski, A., Cajko, J.

Inst : Leningrad State University

Title : Spectral Method of Determining Isotopic Composition of Lead. Part I.

Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 5, 530-543

Abstract : The authors describe the spectral standardless method of the analysis of the isotopic composition of Pb by the relative intensities of the components of the hyperfine structure of the 4058 Å line. The spectra of the investigated samples were excited in a cooled hollow cathode. The optical portion of the apparatus consisted of a monochromator and a Fabry-Perot etalon. The intensities of the components were registered by

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CZECHOSLOVAKIA/Optics - Optical Method of Analysis.

K

Abs Jour : Ref Zhur Fizika, No 1, 1960, 2267  
 Author : Zajdel, A.N., Zhiginski, A.G., Cajko, J.  
 Inst : Leningrad State University  
 Title : Spectral Method of Determining the Isotopic Composition of Lead. Part II.  
 Orig Pub : Chekhosl. fiz. zh., 1958, 8, No 6, 665-684  
 Abstract : The author describes various versions of a procedure for analyzing the isotopic composition of Pb, providing for the determination of Pb<sup>204</sup>, 206, 207, 208. The lead was extracted from the analyzed samples with the aid of a preliminary chemical processing in the form of PbI<sub>2</sub>. The spectra were excited in a hollow cathode, cooled with liquid air. The spectral instrument was a monochromator, crossed with a

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... measurement of the intensity of the components of the hyperfine structure of the PbI 4050 Å line. Several versions are proposed both for the standardless method and for the one employing standards, as well as several methods of computation.

APPROVED FOR RELEASE: 03/15/2001

CIA-RDP86-00513R001964020016-2

M.E. Britske

Card 2/2

SOURCE CODE: UR/0413/66/000/010/00[0/00]0

INVENTOR: Moskver, K. B.; Zayd, E. G.; Shirokov, S. S.; Shitsman, A. S.; Neusypina, N. I.

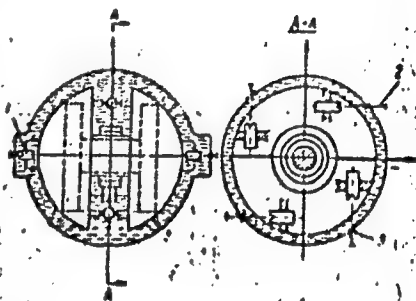
ORG: None

TITLE: A three-way gyroscopic float device. Class 42, No. 182346

SOURCE: Izobreteniya, promyshlennyye obraztzy, tovarnyye znaki, no. 11, 1966, 78

TOPIC TAGS: gyroscope system, gyroscope suspension

ABSTRACT: This Author's Certificate introduces a three-way gyroscopic float device consisting of a gyro unit fastened to an elastic torsional support and suspended in a liquid. Provision is made for balancing the instrument after final adjustment by equipping the gyro unit with balancing weights which may be moved with respect to its center of gravity along coordinate axes by adjustment wrenches. These wrenches are fastened in the housing of the device by hermetic couplings which permit reciprocating and rotary motion.



SUB CODE: 17/ SUBM DATE: 030ct63  
Card 1/1

UDC; 621-752.4



ZAYDEL, A. N.

AUTHORS: Buftin, O. I. , Zaydel', A. N. , Kaliteyevskiy, N. I. <sup>75-1-19/26</sup>

TITLE: The Spectrochemical Determination of Platinum and Palladium in Uranium (Spektrokhimicheskoye opredeleniye platiny i palladiya v urane)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958, Vol 13, Nr 1, pp 116-118 (USSR)

ABSTRACT: In the determination of small quantities of elements of the platinum group in uranium the usual methods of spectral analysis do not lead to success. Therefore a concentration of the elements to be determined must be brought about by chemical methods. According to several authors noble metals are separated from ores by crucible melting with lead. In the analysis of fairly pure samples of uranium, however, this task can be solved much more simply by precipitation of the elements of the platinum group with hydrogen sulfide as sulfides. On that occasion practically all uranium remains in solution. In order to attain a sensitivity of the analysis of about  $10^{-4}$  %, copper was taken as carrier, which possess a good

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75-1-19/26

## The Spectrochemical Determination of Platinum and Palladium in Uranium

collecting action for platinum sulfide. The precipitation took place in a hot 2n-sulfuric solution which contained 0,1 mg Cu on 1g uranium. The sulfides were dissolved in aqua regia and brought onto the surface of a carbon electrode moistened with a solution of polystyrene in benzene. The completeness of the precipitation of platinum and palladium was spectroscopically proved. In the spectroscopic determination of Pt and Pd in artificial mixtures ( $10^{-4}$  -  $10^{-2}$  % Pt and Pd in uranium) a rectilinear dependence of the blackening of the lines of analysis on the logarithm of the concentration of the element to be determined exists. This simple method of the joint precipitation of the sulfides of platinum and palladium with copper sulfide permits a practically complete separation of uranium. In the spectrum of the concentrate no lines of uranium could be proved any long. The spectrum poor in lines of copper does not hinder the spectroscopic determination of platinum and palladium. (Technical data of the apparatus used are then given). For the calibration of the spectrum, copper proved to be useless as reference element, as it falsifies the results of the determination of platinum and palladium.

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75-1-19/26

## The Spectrochemical Determination of Platinum and Palladium in Uranium

dium in uranium samples which are polluted with copper. As another suitable element which is quantitatively precipitated together with copper as sulfide was difficult to find, the standard element was not added to the initial sample, but to the concentrate after the concentration. Gold (0,01 %  $\text{AuCl}_3$ -solution) was taken in a quantity that 2  $\mu\text{g}$  metallic gold were deposited on the electrode. The lines of analysis of platinum were at 2659,45 Å, and 3421,24 Å respectively, the corresponding reference lines of gold at 2675,95 Å and 3122,78 Å respectively. The somewhat great distance in the wave lengths of the used lines of platinum and palladium plays a minor part, as the accuracy in the determination of such small quantities is comparatively low. This method of calibration diminishes the errors which occur in photographing the spectrum and simplifies the performance of the analysis. Series tests showed that the uncontrollable errors originating from the precipitation of the sulfides are very few. The total error of a determination at concentrations of platinum in uranium of about  $10^{-4}$  % lay below 20 %. It is composed of errors in concentration, of calibration errors and

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# The Spectrochemical Determination of Platinum and Palladium in Uranium

errors in the spectral analysis of the concentrate. By means of the calibration lines platinum in uranium can be identified with a sensitivity of  $10^{-4}$  % and palladium with a sensitivity of  $3 \cdot 10^{-5}$  %. This method can also be employed for the determination of platinum and palladium on other materials. The most important conditions for applicability is that the chief component of the sample is not precipitable with hydrogen sulfide in a sulfuric solution. Especially the possibility of application for the determination of platinum in a mixture of the rare earth metals was examined. On the introduction of hydrogen sulfide into a solution of the sulfates of the rare earth metals the latter remain in the solution, whereas platinum is precipitated together with the carrier (copper). The sensitivity of the determination is somewhat lower than in the determination of platinum in uranium, as the low solubility of the sulfates of the rare earth metals requires smaller weighed portions of the samples for the analysis. The corresponding experiments were performed by G. G. Kund and P. P. Yakimovoy. There are 1 figure, 1 table, and 3 references, 1 of which is Slavic.

Card 4/5

75-1-19/26

The Spectrochemical Determination of Platinum and Palladium in Uranium

ASSOCIATION: Leningrad State University imeni A. A. Zhdanov  
(Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova)

SUBMITTED: February 7, 1957

AVAILABLE: Library of Congress

1. Platinum - Determination
2. Palladium - Determination
3. Uranium - Spectrographic analysis

Card 5/5

AUTHORS: Zaydel', A. N., Petrov, K. I.

SOV/32-24-8-29/43

TITLE: The Determination of Hydrogen in Tantalum, Niobium, and Uranium (Opredeleniye vodoroda v tantale, niobii i urane)

PERIODICAL: Zavodskaya Laboratoriya, 1958, Vol. 24, Nr 8, pp. 1000-1001 (USSR)

ABSTRACT: For these determinations the same method of isotopic counterbalancing was used which was devised for the determination of hydrogen in steel, zirconium and titanium. The apparatus and the experimental procedure were described in an earlier paper. Since the proper conditions must prevail for these determinations, experiments were carried out to determine the optimal conditions. These were found to be: for niobium and tantalum a temperature of 800° and a heating time of 15 minutes; for uranium a temperature of 1000° and heating for 30 minutes. The analytical results are tabulated. It was found that the hydrogen content of metals can be determined in the equilibrium gas phase resulting after decomposing the isotopic mixture. The sensitivity of the method per gram of metal is  $1 \cdot 10^{-4}\%$  by weight, and the


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The Determination of Hydrogen in Tantalum,  
Niobium, and Uranium

SOV/32-24-8-29/43

standard deviation is  $\pm 8$  to  $\pm 10\%$  (average square error).

There are 2 figures, 1 table, and 2 references, which  
are Soviet.

  
Card 2/2

KUCHINA, P.M.; MATROSOVA, T.V.; BORGEST, V.A.; ZAYDEL', A.N.; PEGROV, A.A.;  
STRELYAYEV, M.I.; GEMINOV, V.N.

Brief reports. Zav. lab. 24 no.8:958, 1034-1035 '58. (MIRA 11:8)

1. Kuznetskiy metallurgicheskiy kombinat (for Kuchina). 2.  
Leningradskiy gosudarstvennyy universitet (for Borgest,  
Zaydel', Pegrov). 3. Kuybyshevskiy inzhenerno-stroitel'nyy  
institut (for Strelyayev).  
(Chemistry, Analytical) (Metals—Testing)  
(Reinforced concrete—Testing)



NY/edw/mw  
7-29-60



24(7)

AUTHORS:

Zaydel', A. N., Ostrovskaya, G. V.

SOV/54-59-3-7/21

TITLE:

Spectroscopic Determination of a Small Deuterium Content in Hydrogen

PERIODICAL:

Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1959, Nr 3, pp 39-43 (USSR)

ABSTRACT:

S. E. Frish and V. I. Chornyyayeva had developed a method of determining quantitatively  $D_2$  in  $H_2$  already in 1934 (Ref 1). In further papers (Refs 2, 3, 4) by Frish and his collaborators they used a high-frequency discharge tube without electrodes for the elimination of the disturbing influence of the metal of the electrodes. The authors of the present paper analyzed in the same way as mentioned in reference 5 the isotopic mixture  $H_2 : D_2$  and found at a ratio of no less than 10:90 of the two isotopic portions an equal ratio of the intensities of the corresponding terms of Balmer's series. The afore-mentioned method is used in the present paper for determining the deuterium content as it is found in natural water sources. Determinations are rendered difficult by the low intensity of the D-lines and by the overlapping of the D-lines by the H-lines. For this

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Spectroscopic Determination of a Small Deuterium  
Content in Hydrogen

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purpose the interference polarization filter was used for the  $H_{\beta}$ -line through which only 1% of the intensity of this line penetrated. The intensity of the  $D_{\beta}$ -line was, among others, measured in its relation to the weakened  $H_{\beta}$ -line. Figure 1 shows data of the recording of the isotope structure for various  $D_2$  contents depending upon pressure. Herefrom it was concluded that in the transition to lower pressures the separate observation of the  $D_{\beta}$ -lines is possible, however, only to pressures of 1-2 torr since the line intensity strongly decreases at still lower pressures. At a content of 10 - 1 %  $D_2$  no standard is necessary for working at a pressure of 10 torr. At a pressure of 6 torr the separation of the isotopes begins. Thus, the  $H_{\beta}$ - and  $D_{\beta}$ -lines can be observed until a pressure of ~1 torr by taking the separation coefficient into account. In a further reduction of the  $D_2$ -content to 0.1% the error of analysis strongly increases; in still stronger dilution standards must be used. By increasing the width of the gap an additional

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Spectroscopic Determination of a Small Deuterium  
Content in Hydrogen

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intensification of the  $D_{\beta}$ -line could be achieved. (Fig 4).  
For setting up the calibration curve the ratio of the line  
intensity  $I_D : I_H$  ( $H'$  = standard) was represented as  
depending on the concentration ratio  $C_D : C_H$ . There are  
2 figures, 5 tables, and 9 references, 6 of which are Soviet.

SUBMITTED: April 15, 1959

Card 3/3

CZECHOSLOVAKIA/Optica - Optical Methods of Analysis.

K

Abs Jour : Ref Zhur Fizika, No 1, 1960, 2266  
Author : Zajdel', A.N., Ziglinskiy, A.G., Cajko, J.  
Inst : -  
Title : Spectral Method of Determination of Isotopic Composition of Lead. Part I.  
Orig Pub : Mat.-fyz. casop. 1959, 9, No 1, 29-45  
Abstract : See Abstract 2265.

Card 1/1

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ZARDEL, A.N.

CZECHOSLOVAKIA/Optics -- Optical Methods of Analysis.

K

Abs Jour : Ref Zhur Fizika, No 1, 1960, 2268

Author : ~~Zardel~~, A.N., Ziglinski, A.G., Cajko, J.

Inst :

Title : Spectral Method of Determining the Asymptotic Composition of Lead. Part II.

Orig Pub : Mat.-fyz. casop., 1959, 9, No 1, 46-68

Abstract : See Abstract 226/.

Card 1/1

5(2),5(4)

AUTHORS: Zaydel', A. N., Lipis, L. V., Petrov, K. I. SOV/75-14-4-24/30

TITLE: Spectrum Analysis by the Method of Evaporation.  
Communication 8. Analysis of Zirconium

PERIODICAL: Zhurnal analiticheskoy khimii, 1959, Vol 14, Nr 4, pp 497-500  
(USSR)

ABSTRACT: The evaporation method for determining the admixtures in  $ZrO_2$  can be applied because the vapor tension of zirconium dioxide vapors is negligible even at relatively high temperatures (Refs 11, 12). Other compounds of zirconium and even metallic zirconium can be easily transferred into dioxide by glowing in the air at 700-800°. This possibility makes gauging very easy as synthetic standards of  $ZrO_2$  are simple to prepare. The success of the evaporation method depends on the right choice of temperature which has to ensure a complete and reproducible separation of the admixtures to be determined from the main component. The optimum temperature of heating zirconium dioxide in air and under decreased pressure is 2000-2100°. The B, Bi, Cd, Cr, Fe, K, Na, Li, Ni, Mn, Pb, Sb, Sn and Si admixtures which have to be

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Spectrum Analysis by the Method of Evaporation.  
Communication 8. Analysis of Zirconium

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determined sublimate almost completely at these temperatures, Al and Mg sublimate to a large percentage. At temperatures  $> 2100^{\circ}$  the evaporation of zirconium dioxide sets in. The degree of evaporation of several admixtures was tested with radioactive isotopes (Ref 9). The conditions for the spectrum analysis of the condensate were the same as in earlier studies. Table 1 gives the blackening of the analytic lines of the admixtures after evaporation in air and in vacuum for the following elements: Al, B, Fe, Mg, Li, Pb. The zirconium dioxide sample contained

$1.10^{-4}\%$  of B and Li and  $1.10^{-2}\%$  of Al, Fe, Mg and Pb each. The pairs of lines used for the analytic determination are listed in table 2. The condensate forms regular and solid layers in the sublimation of the admixtures in vacuum. Therefore the substance enters the zone of discharge with more effect as when the sublimation is carried out under atmospheric pressure. The condensation coefficients of the additions are higher in vacuum (with the exception of Bi, Cd, and Pb). In order to keep the evaporation conditions and the excitation of spectra constant and to eliminate "third" components, the method of the inner

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Spectrum Analysis by the Method of Evaporation.  
Communication 8. Analysis of Zirconium

SOV/75-14-4-24/30

standard was applied. Cobalt and gallium were used as inner standards. By this a high reproducibility of the determination is achieved: for manganese and chromium 8%, for boron 9%, for iron, nickel, magnesium, silicon, bismuth, antimony, tin, and lead 10%, for cadmium 11% and for aluminum, potassium, sodium, and lithium 20%. The reliability of the method was tested by comparing the obtained results with results obtained in chemical determinations (Table 3). The sensitivity of the determination of the admixtures in  $ZrO_2$  is the same as it is in the analysis of  $ThO_2$  and  $BeO_2$  (Ref 7). It exceeds the sensitivity of the method of fractionated evaporation with a carrier (Ref 3) and the method of the direct "burning" of zirconium in different light sources (Refs 1, 2). The investigations described in this paper were conducted in 1952 - 1953. There are 2 figures, 3 tables, and 13 references, 7 of which are Soviet.

SUBMITTED: April 7, 1958

Card 3/3

ZAYDEL', A.N.; OSTROVSEAYA, G.V.

Spectral determination of small concentrations of deuterium in  
hydrogen. Vest.IGU 14 no.16:39-43 '59. (HIRA 12:10)  
(Deuterium--Spectra) (Hydrogen--Spectra)

BORGES\*, V.A.; ZAYDEL', A.M.; PETROV, A.A.

Unit for the spectral-isotopic determination of hydrogen in metals.  
Trudy kom.anal.khim. 10:270-277 '60. (MIRA 13:8)

1. Leningradskiy gosudarstvennyy universitet.  
(Hydrogen--Analysis)  
(Chemical apparatus)  
(Metals--Hydrogen content)  
(Deuterium)